

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings, and all prior versions, of claims in the application.

LISTING OF CLAIMS:

1. (currently amended) A method of inspecting a pattern, comprising the steps of:

sensing images of corresponding areas of two patterns, which are originally formed so as to have an identical shape on a substrate, to obtain a reference image and an inspection image;

with respect to the reference image and the inspection image obtained by sensing images of the corresponding areas, performing a first correction of a difference in brightness for effecting correspondence between each of corresponding first unit areas area and performing a second correction of a difference in brightness for each of second unit areas which are larger than area which covers at least one of the first unit areas; and

detecting a defect using the reference image and the inspection image for which the correction of brightness for each first unit area and the correction of brightness for each second unit area have been performed.

2. (currently amended) A method of inspecting a pattern according to claim 1,

wherein a difference of brightness which occurs in a belt shape in the reference image and the inspection image ~~according to~~ is corrected by the first correction of brightness for each first unit area ~~is corrected~~, and a difference of brightness which occurs at random in the reference image and the inspection image

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

~~according to~~ is corrected by the correction of brightness for each second unit area is
~~corrected.~~

3. (currently amended) A method of inspecting a pattern, comprising the steps of:

sensing images of corresponding areas of two patterns, which are formed so as to originally have an identical shape on a substrate, to obtain a reference image and an inspection image;

correcting a difference of brightness between the reference image and the inspection image obtained by sensing images of the areas ~~in multiple stages by different area units~~ with two steps, in the first step subjecting plural small areas and in the second step subjecting a large area which covers the plural small areas;

comparing the images for which brightness is corrected in multiple stages to obtain a difference image between both images; and

comparing the difference image with a threshold value corresponding to the areas of the images to detect a defect.

4. (currently amended) A method of inspecting a pattern according to claim 3,

wherein the correction of brightness ~~in multiple stages~~ the two steps is performed by changing the size of a unit area for which brightness correction is performed on the images.

5. (currently amended) A method of inspecting a pattern according to claim 3,

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

wherein a positional deviation between the reference image and the inspection image obtained by sensing images of the areas is corrected, and a difference of brightness between corresponding parts of the reference image and the inspection image, for which positional deviation is corrected, is corrected in multiple stages by different area units by the two steps.

6. (original) A method of inspecting a pattern according to claim 3, wherein the threshold value according to the areas of the images is a threshold value corresponding to a difference of partial brightness of the images.

7. (currently amended) A method of inspecting a pattern, comprising the steps of:

sequentially sensing images of corresponding areas of two patterns, which are originally formed so as to have an identical shape on a substrate, using an image sensor to sequentially capture images of the corresponding areas; and

performing a first correction of positional deviation of the sensed images of corresponding areas of two patterns, a second correction of difference in brightness between the sensed images of corresponding areas of two patterns by two steps in which the first step includes subjecting plural small areas and the second step includes subjecting a large area which covers the plural small areas, and detection-a detection of a defect by parallel processing with respect to images subsequently captured by sensing images of the areas with the image sensor,

wherein the images are processed at a processing speed substantially equal to an image capturing speed of the image sensor.

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

8. (original) A method of inspecting a pattern according to claim 7,
wherein the speed for processing the images is in the range of 1.6 Gpps to
6.4 Gpps.

9. (currently amended) An apparatus for inspecting a pattern, comprising:
image sensing means which senses images of corresponding areas of two
patterns, which are originally formed so as to have an identical shape on a substrate;
and

image processing means which uses a reference image and an inspection
image, which are obtained by sensing images of the areas using the image sensing
means, to detect a defect,

wherein the image processing means comprises:

a brightness correction unit which, with respect to the reference image and
the inspection image obtained by sensing images of the corresponding areas,
~~performs correction of a difference in brightness for effecting correspondence~~
~~between each of first unit areas and a difference in brightness for each of second~~
~~unit areas which are larger than the first unit areas~~
a first correction of a difference of
brightness for each corresponding first unit area and further performs a second
correction of a difference of brightness for each second unit area which covers at
least one of the first unit areas; and

a defect detection unit which detects a defect using the reference image and
the inspection image for which the correction of brightness for each first unit area
and the correction of brightness for each second unit area have been performed by
the brightness correction unit.

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

10. (original) An apparatus for inspecting a pattern according to claim 9, wherein the brightness correction unit corrects a difference of brightness which occurs in a belt shape in the reference image and the inspection image according to the correction of brightness for each first unit area, and a difference of brightness which occurs at random in the reference image and the inspection image according to the correction of brightness for each second unit area.

11. (currently amended) An apparatus for inspecting a pattern, comprising: image sensing means which senses images of corresponding areas of two patterns, which are originally formed so as to have an identical shape on a substrate; and

defect detecting means which detects a defect using the reference image and the inspection image obtained by sensing images of the corresponding areas with the image sensing means;

wherein the defect detecting means comprises:

a brightness correction unit which corrects a difference of brightness between the reference image and the inspection image, which are obtained by sensing images of the areas with the image sensing means, ~~in multiple stages by different area units with two steps, in the first step subjecting plural small areas and in the second step subjecting a large area which covers the plural small areas;~~

a difference image generation unit which compares the images for which brightness is corrected ~~in multiple stages by the two steps~~ by the brightness correction unit to obtain a difference image between both the images; and

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

a defect detection unit which compares the difference image obtained by the difference image generation unit with a threshold value corresponding to the areas of the images to detect a defect.

12. (currently amended) An apparatus for inspecting a pattern according to claim 11,

wherein the brightness correction unit performs the correction of brightness in ~~multiple stages~~the two steps by changing the size of a unit area for which brightness correction is performed on the images.

13. (currently amended) An apparatus for inspecting a pattern according to claim 11,

further comprising a positional deviation correction unit which corrects a positional deviation between the reference image and the inspection image obtained by sensing images of the areas with the image sensing means, and corrects a difference of brightness between corresponding parts of the reference image and the inspection image, for which positional deviation is corrected by the positional deviation correction unit, in ~~multiple stages~~by the two steps by different area units in the brightness correction unit.

14. (original) An apparatus for inspecting a pattern according to claim 11, wherein the defect detection unit uses a threshold value corresponding to a difference of partial brightness of the images as the threshold value according to the areas of the images.

Docket No. 501.43637X00
Serial No. 10/797,011
Office Action dated August 10, 2007

15. (currently amended) An apparatus for inspecting a pattern, comprising:
image sensing means which sequentially senses images of corresponding areas of two patterns, which are originally formed so as to have an identical shape on a substrate, using an image sensor to sequentially capture images of the corresponding areas; and

defect detecting means which processes the images sequentially captured by the image sensing means to detect a defect,

wherein the defect detecting means comprises plural processing units for processing the images, which are sequentially captured by sensing images of the corresponding areas with the image sensor of the image sensing means, and executes ~~correction~~ a correction of positional deviation of the captured images of corresponding areas, ~~correction~~ a correction of difference in brightness between the captured images of corresponding areas by two steps in which the first step includes subjecting plural small areas and the second step includes subjecting a large area which covers the plural small areas, and ~~detection~~ a detection of a defect of the images, which are sequentially captured, in parallel in plural processing units to thereby process the images at a processing speed substantially equal to an image capturing speed of the image sensor of the image sensing means.

16. (previously presented) An apparatus for inspecting a pattern according to claim 15,

wherein the defect detecting means processes the images at a speed in the range of 1.6 Gpps to 6.4 Gpps.

Docket No. 501.43637X00
Serial No.10/797,011
Office Action dated August 10, 2007

17. (original) An apparatus for inspecting a pattern according to claim 15,
wherein the image sensor of the image sensing means is a TDI image sensor
of a parallel output type.